1756

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/838,126
Filing Date	Apr 20, 2001
First Named Inventor	Trost, David C.
Group Art Unit	1756
Examiner Name	Unassigned
Total Number of Pages in This Submission	
Attorney Docket Number	5524/ESI-00-12

ENCLOSURES ***(check all that apply)***

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment / Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [x] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (*please identify below):*
  1. Form 1449 with 14 references
  2. Declaration of Saul Arnold in Support of Information Disclosure Statement
  3. Exhibits A-E
  4. Return Receipt Postcard to Applied Materials, Inc.
  5. Return Receipt Postcard to Kenneth C. Brooks

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Law Office of Kenneth C. Brooks Kenneth C. Brooks
Signature	Kenneth C. Brooks
Date	July 8, 2002

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Director for Patents, Washington, D.C. 20231 on this date:

Type or printed name	Kenneth C. Brooks		
Signature	Kenneth C. Brooks	Date	July 8, 2002

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time your are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Director for Patents, Washington, DC 20231.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Trost, David — PATENT APPLICATION
Serial No: 09/838,126 — Group Art Unit: 1756
Filed: April 20, 2001 — Examiner: unassigned
For: METHOD AND SYSTEM TO ACHIEVE THERMAL TRANSFER BETWEEN A WORKPIECE AND A HEATED BODY DISPOSED IN A CHAMBER

DECLARATION OF SAUL ARNOLD IN SUPPORT OF INFORMATION DISCLOSURE STATEMENT

I, SAUL ARNOLD, declare as follows:

1. I am over the age of eighteen years, and at all times relevant herein was employed by the Assignee of the inventions defined by the claims in the above-identified patent application as an attorney.

2. I make this statement in support of an Information Disclosure Statement, which I am informed and believe will be filed herewith.

3. On or about June 24, 1999 Quotation No. M89899, attached hereto as Exhibit A, was provided to representatives of Intel Corporation concerning the MEBES-X Preproduction Electron Beam Lithography System along with Etec documents entitled MEBES-X Preproduction System Technical Description, Etec document number 0999-0295B attached hereto as Exhibit B, and MEBES-X Preproduction System Acceptance Test Procedure, Etec document number 0900-3417C, attached hereto as Exhibit C.

4. On or about March 1, 2000 Quotation No. M89942, attached hereto as Exhibit D, was provided to representatives of DuPont Photomasks, Inc. concerning the MEBES-X Preproduction Electron Beam Lithography System along with Exhibits B and C.

5. On or about March 22, 2000 Quotation No. M89946, attached hereto as Exhibit E, was provided to representatives of IBM Corporation ("IBM") concerning the MEBES-X Preproduction Electron Beam Lithography System along with Exhibits B and C.

6. At the time the quotations and documents mentioned above in paragraphs 3, 4 and 5 were provided to the respective recipients, the MEBES-X Preproduction Electron Beam Lithography System was incomplete, and required further engineering and testing efforts to complete the design so that it could be manufactured.

7. The activities described above in paragraphs 3-5 were undertaken to facilitate development of the MEBES-X Preproduction Electron Beam Lithography System by offsetting some of the capital expenditures required to build the same to further testing and completion of the design of the MEBES-X Preproduction Electron Beam Lithography System. To that end, these activities were undertaken to create a development partnership with a potential customer.

8. On or about April 18, 2001, IBM participated in factory acceptance (FAC) testing of the MEBES-X Preproduction Electron Beam Lithography System at Etec's facility in Hayward, California. Although the MEBES-X Preproduction Electron Beam Lithography System was incomplete in that it did not function so as to satisfy the FAC tests, IBM agreed to accept shipment of the same so that further development could take place at a location better suited to testing the developments as they took place. On or about April 30, 2001 Etec shipped the incomplete MEBES-X Preproduction Electron Beam Lithography System to IBM. Upon arrival at IBM's facility the incomplete MEBES-X Preproduction Electron Beam Lithography System went through installation procedures and testing. As expected, the incomplete MEBES-X Preproduction Electron Beam Lithography System did not satisfy all the requirements of the testing. However, the testing served to better indicate where further development was required.

9. As envisioned by Etec, further engineering efforts were commenced to complete the MEBES-X Preproduction Electron Beam Lithography System. In particular, Etec commenced five engineering projects in an effort to complete the MEBES-X Preproduction Electron Beam Lithography System so that the same would function so as to satisfy all the criteria set forth in the FAC. A first engineering project involved dark-to-clear-mean-to-target-offset to facilitate precise alignment of a pattern on a plate in both dark field and clear field operations. A second engineering project involved improving the X-Y bias to properly align the plate. A third engineering project involved mean-to-target and critical dimension repeatability so that a pattern may be

accurately written multiple times on differing plates. A fourth engineering project involved placement of adjacent pattern stripes, and a fifth engineering project involved software modifications.

10. On January 24, 2002, after approximately nine (9) months following installation and continued engineering efforts on the aforementioned projects, the MEBES-X Preproduction Electron Beam Lithography System was complete. This was evidenced by a demonstration of the system performance according to the procedures setout in the MEBES-X Preproduction System Acceptance Test Procedure, ETEC document number 0900-3417C at the IBM facility. After that, IBM agreed to accept the MEBES-X Preproduction Electron Beam Lithography System.

The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application and any patent that may issue therefrom.

DATE: 7/2/02

PAUL ARNOLD, Intellectual Property Counsel, Etec Systems, An Applied Materials Company

#5/7-30-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Trost, David — PATENT APPLICATION
Serial No: 09/838,126 — Group Art Unit: 1756
Filed: April 20, 2001 — Examiner: unassigned
For: METHOD AND SYSTEM TO ACHIEVE THERMAL TRANSFER BETWEEN A WORKPIECE AND A HEATED BODY DISPOSED IN A CHAMBER

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
and Trademarks
Washington, D.C. 20231

Sir:

The following is submitted in compliance with Applicants' duty of disclosure under 37 C.F.R. § 1.56. A copy of each of the references recited below accompanies this document.

PATENT DOCUMENTS

Patent Number	Inventor	Grant Date
3,336,491	Mercer et al.	Aug. 15, 1967
3,449,653	Koppelmann	Jun. 10, 1969
4,099,727	Weiler	Jun. 11, 1978
4,118,042	Booth	Oct. 3, 1978
4,234,175	Sato et al.	Nov. 18, 1980
5,447,431	Muka	Sep. 5, 1995
5,450,332	Criscuoli et al.	Sep. 12, 1995
5,520,538	Muka	May 28, 1996
6,130,490	Lee	Oct. 10, 2000

NON-PATENT MATERIAL

As set forth in paragraphs 3, 4 and 5 of the attached Declaration of Saul Arnold (referred to as the "Declaration"), certain activities (referred to as "ACTIVITIES") occurred more than one year prior to the

filing date of the present patent application. First activity, as set forth in paragraph 3 of the Declaration, a representative of Etec Systems, Inc. ("Etec") provided quotation number M89899 (attached as Exhibit A to the Declaration, and referred to herein as "EXHIBIT A") to representatives of Intel Corporation on or about June 24, 1999. Exhibit A relates to a MEBES-X Preproduction Electron Beam Lithography System (referred to as the "SYSTEM"). Second activity, as set forth in paragraph 4 of the Declaration, a representative of Etec provided quotation number M89942 (attached as Exhibit D to the Declaration, and referred to herein as "EXHIBIT D") to representatives of DuPont Photomasks, Inc. on or about March 1, 2000. Exhibit D also relates to the SYSTEM. Third activity, as set forth in paragraph 5 of the Declaration, a representative of Etec provided quotation M89946 (attached as Exhibit E to the Declaration, and referred to herein as "EXHIBIT E") to representatives of IBM Corporation on or about March 22, 2000. Exhibit E also relates to the SYSTEM.

Although the ACTIVITIES occurred more than one year prior to the filing date of the patent application, the ACTIVITIES are not prior art. Specifically, the ACTIVITIES are not prior art because they were primarily experimental in nature because patentee's[1] primary purpose in undertaking the ACTIVITIES was to facilitate testing of the claimed inventions in the environment in which the claimed inventions were intended to operate.

To summarize the law, a patentee "who seeks to protect his discovery may conduct extensive testing without losing his right to obtain a patent" pursuant to 35 USC section

[1] The term patentee is used throughout to refer collectively to the inventor and the assignee.

102(b). See Pfaff v. Wells Electronics, Inc., 48 USPQ 1641, 1645 (S.Ct. 1998). So long as the patentee's activities are experimental, application of 35 USC section 102(b) may be negated. See EZ Dock v. Schafer Systems, Inc., 276 F.3d 1347, 1351 (Fed. Cir. 2002). This is true despite the fact that the invention is used in public for more than one year before the filing of the patent application in which the invention is claimed and is the subject of an underlying sale to a third party who controls the environment in which the invention is tested. See U.S. Environmental Products Inv. v. Westall, 911 F.2d 713, 15 USPQ2d 1898 (Fed. Cir. 1990). To determine whether the underlying purpose of the patentee's pre-critical date activities are experimental in nature, the court focuses on several factors. See EZ Dock v. Schafer Systems, Inc., 276 F.3d 1347 (Fed. Cir. 2002). These factors include, but are not limited to (1) the nature of the invention, (2) whether the invention reasonably requires evaluation under actual conditions of use, (3) whether testing was systematically performed, (4) the amount of control over the experiment retained by the inventor, and (5) the nature of contacts made with potential customers. See generally EZ Dock v. Schafer Systems, Inc., 276 F.3d 1347, 1352-1353 (Fed. Cir. 2002).

We now examine each of these factors below.

FACTOR I

Nature of the Invention

The nature of the invention defined by the claims in the present patent application (hereinafter referred to as the "INVENTION") is a method and system to achieve thermal transfer between a workpiece disposed within a chamber

containing a heated body. To that end: (a) the workpiece is placed at a first position within the chamber, spaced-apart from the heated body a first distance; (b) the pressure within the chamber is established to be a predetermined level; and (c) the workpiece is then placed at a second distance from the heated body to effectuate thermal transfer between the body and the workpiece, wherein the second distance is less than the first distance. (See claim 1.) As stated at page 9, lines 4-6, of the patent application, the INVENTION facilitates precise placement of a pattern written on a plate in an e-beam pattern generator. Thus, the INVENTION is directed toward avoiding thermal fluctuations that produce problematic dimensional changes to ensure that a pattern may be precisely located on the plate. (See id.) As one can see from this, the nature of the INVENTION, i.e., to avoid thermal fluctuations, leads one to conclude that experimental testing is required because of the practical impossibility of determining whether the INVENTION worked properly to avoid thermal fluctuations outside of its intended environment.

FACTOR II

Whether the Invention Reasonably Requires Evaluation Under Actual Conditions of Use

The environment in which the INVENTION is intended to operate is the SYSTEM. Further, as one can readily appreciate from the following, the operational inter-dependence among the INVENTION and the other subsystems associated with the SYSTEM are such that testing in the SYSTEM is required to determine whether the INVENTION will

operate properly in its intended environment to avoid thermal fluctuation.

Specifically, the INVENTION is included in the SYSTEM's automatic material handling system ("AMHS"). The AMHS, along with a write module and assorted electronics, constitutes the major components of the SYSTEM. (See pages 14-15 of the MEBES-X Preproduction System Technical Description attached as Exhibit B to the Declaration (referred to as "EXHIBIT B".) The SYSTEM also includes a vacuum subsystem, a process control subsystem and an operator control subsystem (See EXHIBIT B at Fig. 9.) Operation of the SYSTEM is controlled by a user operator accessing the operator control subsystem. (See EXHIBIT B at page 25.) Specifically, "[u]sing a touch-screen located at the front of the AMHS, the operator commands the AMHS to load a specific type of mask blank into one of 27 temperature-controlled storage garages." (See EXHIBIT B at page 7.) "The AMHS aligns the mask in the pallet using machine vision for position measurement." (See EXHIBIT B at page 7.) "It then connects a grounding clamp to the mask and loads the mask/pallet combination into an airlock, from which it is placed onto the stage." (See EXHIBIT B at page 7.)

The INVENTION operates in conjunction with the airlock to "speed the rate at which masks come to thermal equilibrium after the adiabatic cooling experienced during chamber pumpdown." (See EXHIBIT B at page 23.) "During writing, the SYSTEM continuously monitors the state of electronic, mechanic, and vacuum subsystems and notes any irregularities in a log file." (See EXHIBIT B at page 8.) "After the pattern is written on the mask, the pallet/mask combination is unloaded by the vacuum robot into the airlock

chamber." (See EXHIBIT B at page 8.) "Then, after controlled venting, it is returned to the atmospheric chamber." (See EXHIBIT B at page 8.) "The atmospheric robot handling system retrieves the pallet/mask combination and returns the mask to the storage garage." (See EXHIBIT B at page 8.) "These handling functions are achieved in a particulate-and temperature-controlled environment." (See EXHIBIT B at page 8.)

"The writing module features . . . hardware designs that improve mask positioned relative to the e-beam." (See EXHIBIT B at page 5.) "The main components of the writing module include an air-bearing x-y stage, . . . stage control, worktable, an active vibration isolation unit, a work (write) chamber . . . e-beam source and column, column control, and data path." (See EXHIBIT B at page 5.) "The stage is an air-bearing assembly, which provides the x- and y- motion and yaw control of the worktable . . ." (See EXHIBIT B at page 5.) "The . . . stage control module controls stage velocity with a factory-installed nonlinear control program . . . " (See EXHIBIT B at page 16.) "The writing strategy is a 16-level grayscaling technique at 320 MHz writing rate." (See EXHIBIT B at page 8.) "The hardware supports dose variation to permit 4 gray levels per pixel." (See EXHIBIT B at page 8.) "For each phase of printing, four dose levels are accumulated." (See EXHIBIT B at page 8.) "Thus, after 4 phases of printing, 16 dose levels are accumulated." (See EXHIBIT B at page 8.) "The graybeam strategy . . . requires one new column function, the per pixel deflection, for enhance graybeam linearity . . . " (See EXHIBIT B at page 9.) "The 50kV e-beam gun and column produce the e-beam and then transfer it to the mask substrate, scanning and switching it on and off to define

the pattern in the resist." (See EXHIBIT B at page 9.) "The column control generates and controls the e-beam." (See EXHIBIT B at page 20.) "It is linked to the . . . stage control module, which controls stage velocity and pixel processor modules so that the three subsystems communicate on the same VME bus." (See EXHIBIT B at page 20.) "The column control module provides the analog control signals, which are required to drive the . . . 50kV column and video signal collection and processing." (See EXHIBIT B at page 20.)

"The graybeam data path . . . converts . . . geometries to graybeam pixel data, which is used to drive the blanking of the e-beam." (See EXHIBIT B at page 21.) "The data path rasterizer subsystem generates the digital pixel information stream and sends it to the pixel processor." (See EXHIBIT B at page 21.) "It transforms a user input file consisting of high-level geometry primitives . . . into a rasterized image." (See EXHIBIT B at page 21.) "The front end of the data path is a software system running on the control computer." (See EXHIBIT B at page 21.) "This software transforms and fractures the geometry data into phases that are sent to individual geometry engines (GEs) in the rasterizer." (See EXHIBIT B at page 21.) "Also included in the process control subsystem is a rasterizer that transforms a user input file, typically consisting of high-level geometry primitives, into a rasterized image." (See EXHIBIT B at page 21.) "Specifically, the rasterizer is software that transforms geometry data into phases that are sent to individual geometry engines (GEs) in the rasterizer to produce digital pixel information." (See EXHIBIT B at page 21.)

As one can readily appreciate from the above, there is substantial operational inter-dependence among the INVENTION and the other subsystems associated with the SYSTEM. Consequently, testing of the INVENTION in its intended environment, i.e., the SYSTEM was required to ensure that the INVENTION would function as intended.

FACTOR III

Whether Testing was Systematically Performed

Objective evidence that testing of the INVENTION was to be systematically performed can be found in the testing requirements for the SYSTEM which are set forth in the MEBES-X Preproduction System Acceptance Test Procedure that is attached as Exhibit C to the Declaration (referred to as "EXHIBIT C"), note that each of EXHIBITS A, D and E incorporates EXHIBIT C. EXHIBIT C makes clear that the performance of the SYSTEM was to be tested to ensure that patterns were accurately placed on a plate. (See EXHIBIT A at paragraph 1.4, Exhibit D at paragraph 5.0, and EXHIBIT E at paragraph 4.0.) Specifically, on page 14 of EXHIBIT C, tests were undertaken to ensure composite placement accuracy, composite overlay accuracy, composite critical dimension line-width uniformity, line edge roughness and composite critical dimension line-width mean-to-target parameters are satisfied. Considering that the INVENTION reduced placement errors by abrogating dimensional changes in the plate, it becomes clear that the performance of the INVENTION would also be the subject of this test. As one can see from this, testing was systematic to ensure that the INVENTION would perform in accordance with its intended environment.

FACTOR IV

Amount of Control Over Experiments Retained by Applicant

Objective evidence that substantial, if not total, control over the testing that was to be exercised by the patentee is found in EXHIBITS A, D and E. In particular, EXHIBITS A, D and E demonstrate that at all times during the ACTIVITIES, the patentee retained substantial, if not near total, control over the SYSTEM during testing. As stated in EXHIBIT A, text-bridging pages 1 and 2, "[C]ustomer accepted the responsibility of providing Etec with equipment performance and process results throughout the beta period . . . defined as the duration of one year from completion of Customer Final Acceptance." Recognizing that the SYSTEM was not fully developed, EXHIBIT A also set forth that the customer/partner may work together to improve the SYSTEM to satisfy the anticipated performance criteria. (See EXHIBIT A, page 3, ¶ 2.) Thus, at all times during testing, patentee was to supervise the activities of the customer/partner.

EXHIBIT D describes more control of the SYSTEM, and, therefore the INVENTION, by the inventors. Specifically, EXHIBIT D omits any indication that the SYSTEM will be sent to the customer/partners facility before the same satisfies the requirements of the Factory Acceptance Test (FAC). As stated in ¶ 2.2.2 of EXHIBIT B, physical control of the SYSTEM is to be retained by the patentee until the Factory Acceptance Test is complete. Specifically, EXHIBIT B requires that the Factory Acceptance Test will be carried out in accordance with the provisions recited in EXHIBIT C. EXHIBIT C makes clear that the Factory Acceptance Test will be carried out by the patentee. (See EXHIBIT C, page 7, ¶

1.) Finally, EXHIBIT D incorporates EXHIBIT C, by reference. (See EXHIBIT D, ¶ 5.0.) Moreover, EXHIBIT E requires the same testing procedures set forth in EXHIBIT D. (See EXHIBIT E, ¶ 4.0.) A copy of EXHIBIT F was provided to the recipients of EXHIBITS, A, D and E. (See the Declaration, ¶¶ 3-5.) Thus, as one can see from the above, substantially total control was maintained over the experiments by the inventors.

FACTOR V

Nature of Contacts Made with Potential Customers

The nature of the contacts with the recipients of EXHIBITS A, D and E (potential customers) show that the primary purpose of the ACTIVITIES was experimental in nature. A major problem encountered by the patentee was how to fund the final development and construction of the SYSTEM in which to test the INVENTION. Specifically, the size and complexity of the SYSTEM made the same costly to develop and construct. This is evidenced by the price reflected in EXHIBITS A, D and E, which are $18.9 million; $17.9 million; and $17.9 million, respectively. The capital-intensive nature of developing and constructing the SYSTEM motivated the patentee to seek a partnership with a potential customer to participate in preproduction development of the SYSTEM. (See EXHIBIT B at page ii; Declaration ¶ 7.) As a result, EXHIBITS A, D and E were distributed to obtain partners to complete development of the SYSTEM in furtherance of the testing of the INVENTION by serving as a means by which to build the environment in which the INVENTION was to be tested. (See DECLARATION OF SAUL ARNOLD ¶ 7.)

Further, the potential customers were provided notice that that the primary purpose of the ACTIVITIES were experimental in nature. In particular, each of Exhibits A, D and E states that the SYSTEM is preproduction and must undergo Preproduction Acceptance Test as set forth in EXHIBIT C. In addition, each of the potential customers was provided a copy of EXHIBIT C giving them notice of the testing requirements. (See Declaration ¶¶ 3-5.)

Finally, the post shipment contacts that the patentee maintained with IBM provides further corroboration that the ACTIVITIES primary purpose were experimental in nature. Specifically, on or about April 18, 2001, IBM participated in factory acceptance testing of an incomplete version of the SYSTEM at Etec's facility in Hayward, California (Declaration ¶ 8.) On or about April 30, 2001 Etec shipped the incomplete version of the SYSTEM to IBM. Finally, on January 24, 2002, approximately nine (9) months following installation of the incomplete version of the SYSTEM, and due to continued engineering development efforts and testing, IBM accepted the SYSTEM. This acceptance followed a demonstration of system performance according to procedures setout in the MEBES-X Preproduction System Acceptance Test Procedure, Etec document number 0900-3417C. (Id.)

Thus, it can be seen from the above that after the shipment date of the incomplete SYSTEM, nine (9) additional months of engineering development efforts and testing were required to complete the SYSTEM. Only at that time could the INVENTION be tested in its intended environment, i.e., in the SYSTEM.

SUMMARY

As one can readily appreciate from the analysis of the five factors provided above, the ACTIVITIES were experimental in nature because the primary purpose behind the ACTIVITIES was to facilitate testing of the INVENTION in the environment in which it was intended to operate, i.e., the completed SYSTEM. As set forth above, the ACTIVITIES were intended: (a) to find a development partner to help fund the engineering effort required to complete development of the SYSTEM; (b) to complete development of the SYSTEM; and (c) to test the INVENTION in its intended environment, i.e., the completed SYSTEM. In light of the above, the ACTIVITIES are not prior art.

Respectfully submitted,

Kenneth C. Brooks
Reg. No. 38,393

CERTIFICATE OF MAILING
I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: BOX Non Fee Amendment, Commissioner for Patents, Washington D.C. 20231

Signed:
Typed Name: Kenneth C. Brooks

Date: July 8, 2002